

NATIVE

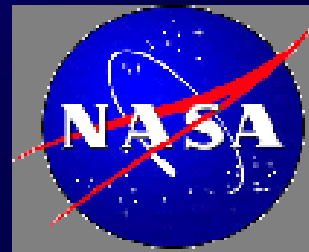
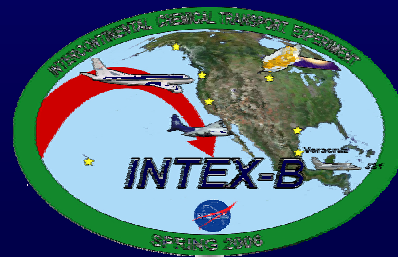
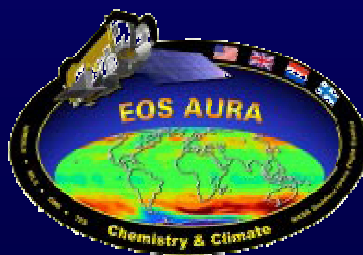
(**N**ittany **A**tmospheric **T**railer and **I**ntegrated
Validation **E**xperiment)

Ozone Column and Profiles in
INTEX-B/Milagro/IONS-06 and WAVES 2006:
OMI Comparisons

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NATIVE Overview/Outline

A mobile research facility designed for:

- Aura validation
- Ground-based complement to NASA field campaigns
- Mobile INTEX Ozone sonde Network Study (IONS) station
- Air quality monitoring
- Investigations of pollution transport and deposition

<http://www.meteo.psu.edu/~btaubman/Webpage/native.html>



- NATIVE provides a comprehensive dataset for Aura validation
- During INTEX-B Phase 2, comparison of total ozone column determined by Aura and NATIVE
- Discussion on the discrepancy of total ozone column

NATIVE Payload

- TeCo Trace Gas Analyzers
 - 49C (O_3)
 - 42CY (NO/NO_y)
 - 43C-TLE (SO_2)
 - 48C-TLE (CO)
- Meteorological instruments
 - T, RH, pressure, wind speed & direction
- 532 nm aerosol LIDAR
- YES UVMFR-7 (UV shadowband radiometer)
- Ozonesonde ground station, daily launches of En-Sci ECC ozonesondes
- Handheld Microtops II sun photometer/ozonometer (NASA-GSFC)



NATIVE Schedule in Aura Validation

- INTEX-B/MILAGRO
 - Houston, TX – Phase 1
March 2, 2006 - March 20, 2006
 - Richland, WA – Phase 2
April 21, 2006 - May 15, 2006
 - Aura validation with WSU MF- DOAS
- WAVES
 - Beltsville, MD
July 7, 2006 - August 3, 2006



Procedures

- **UV Shadowband Radiometer**

Calculations made from Langley analyses and climatological ozone values determine total optical depth and total ozone column

- **Ozonesondes**

- Total ozone amounts from integrated ozonesonde profiles and SBUV measurements above maximum balloon altitude
- Same procedure used for SHADOZ and IONS-06

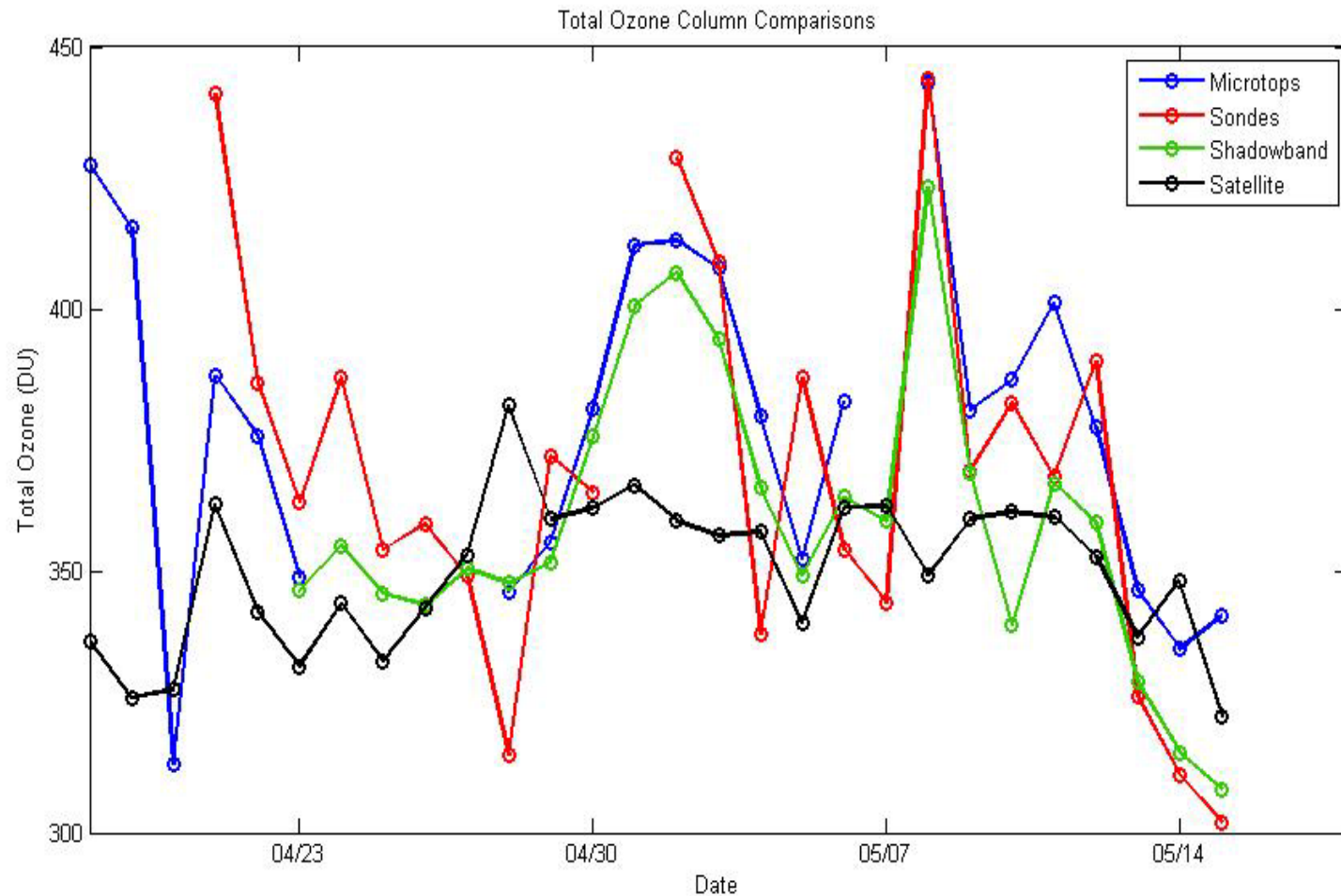
<http://croc.gsfc.nasa.gov/shadoz/>

<http://croc.gsfc.nasa.gov/intexb/ions06.html>

- **Microtops II**

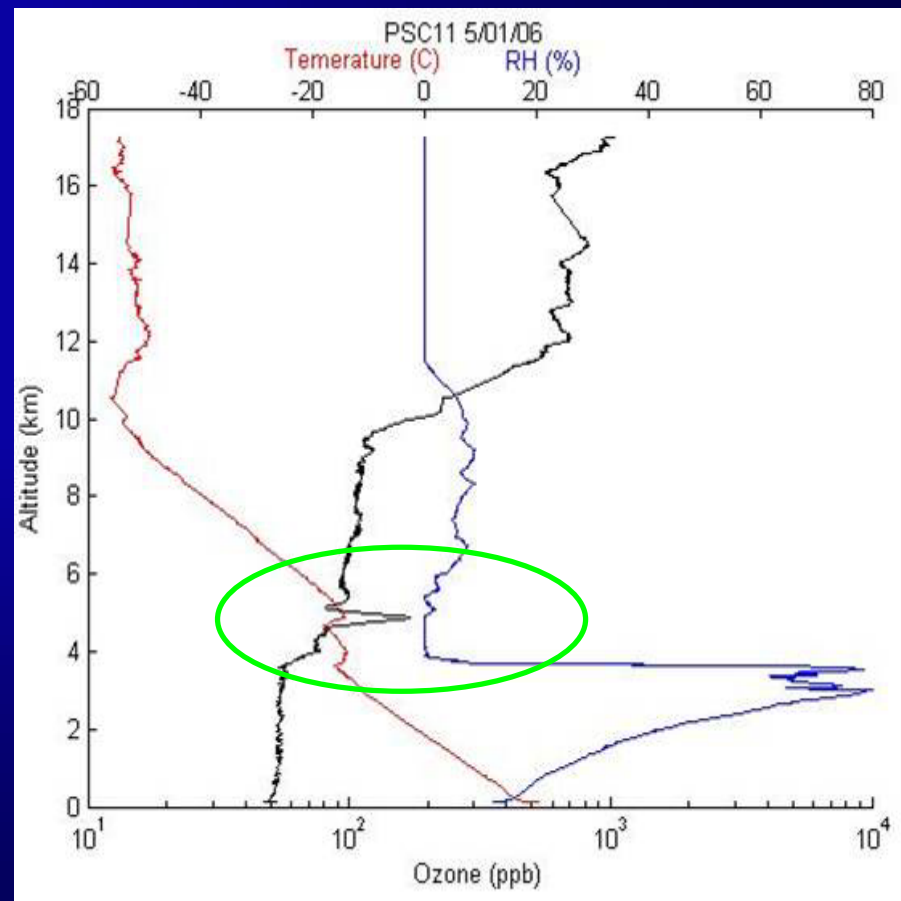
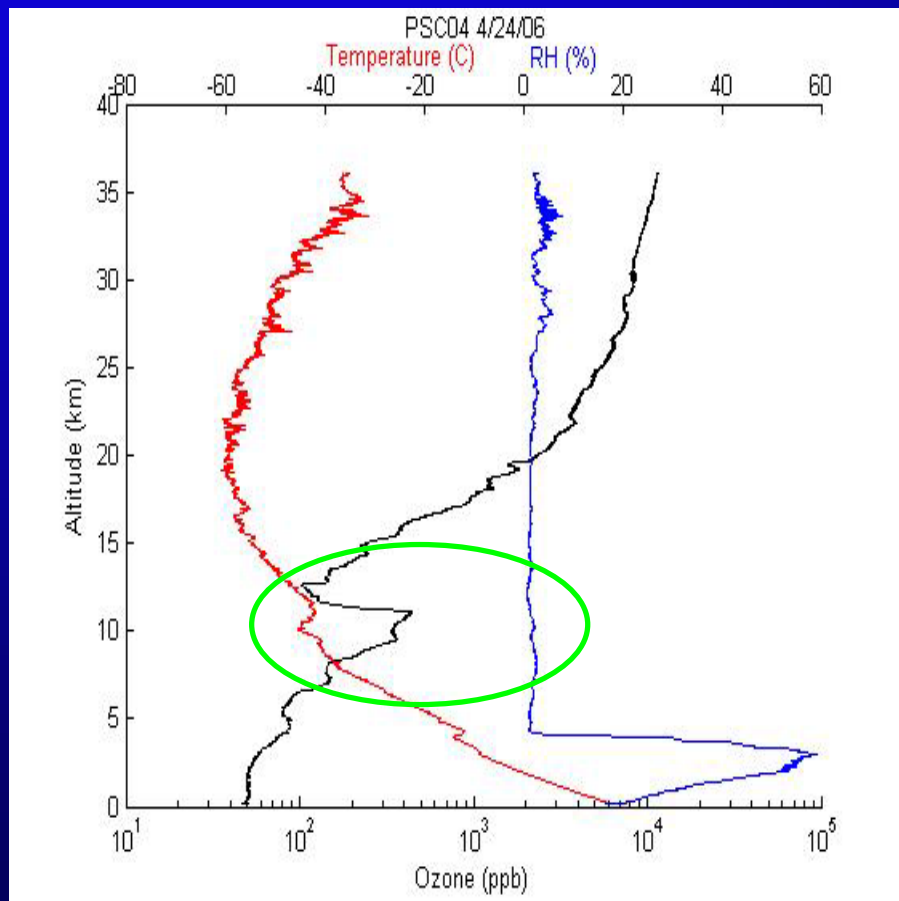
Measures total ozone columns

Total Ozone Column Comparison



- Low balloon burst on 4/27 & 5/1

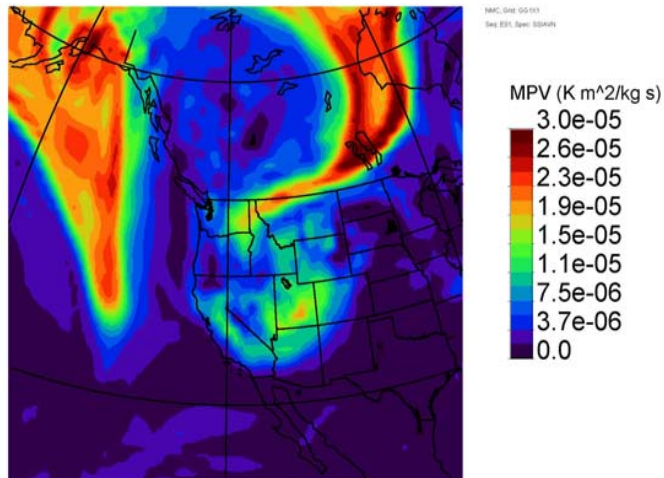
Ozone Profiles



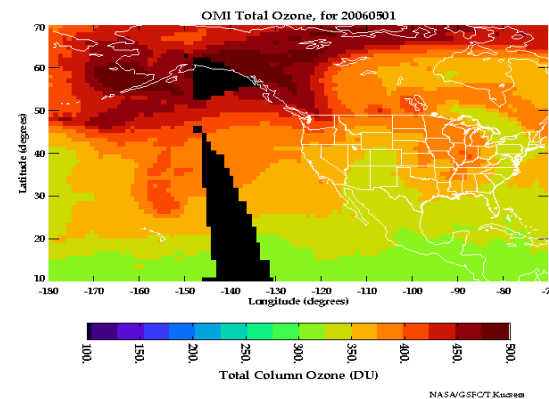
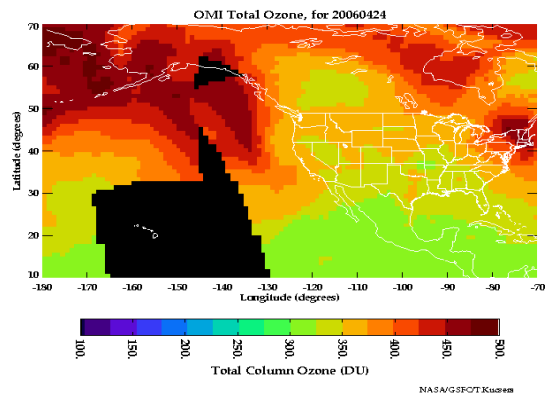
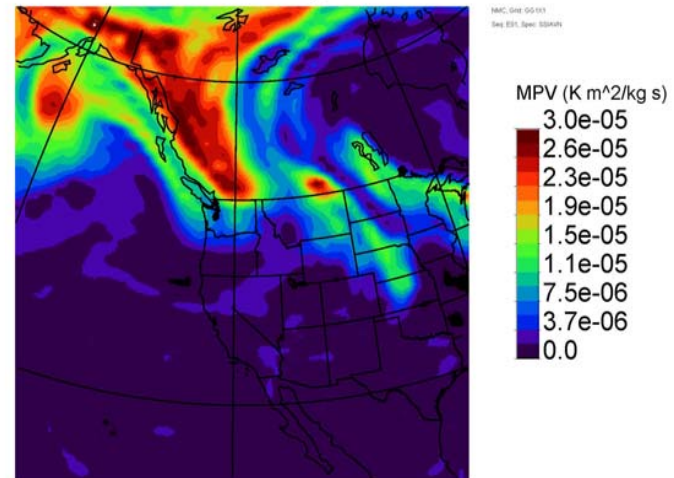
Strat/trop exchange observed on days with high potential vorticity (PV)

OMI Total Ozone/ PV Plots

12 UTC on 24 April, 2006 at 320.0 K



18 UTC on 1 May, 2006 at 320.0 K



During both periods of comparatively low total ozone column by satellite, areas of high PV are in place over eastern Washington

Conclusions & Future Work

- Comprehensive data set from NATIVE for 25 days while in Richland, WA during INTEX-B Phase 2 (4/21/06- 5/15/06)
 - Daily data can be found on AVDC website
 - Daily plots (Press, Temp, RH, WS, WD, O₃, SO₂, NO/NO_y, CO) can be found at our website:
<http://www.meteo.psu.edu/~btaubman/Webpage/native.html>
- Overall, good comparison of total ozone columns between Aura & NATIVE instruments
- Discrepancy in total ozone amounts during periods of stratospheric intrusion
- Further comparison of tropospheric ozone

Acknowledgements

NASA Aura Validation/Tropospheric Chemistry Program

PNNL/Battelle

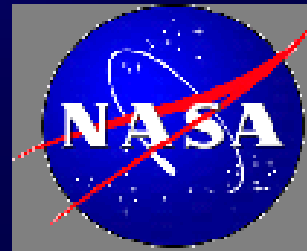
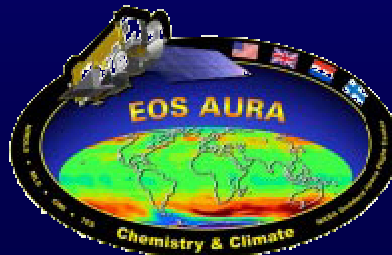
Jim Mather

NATIVE: <http://www.meteo.psu.edu/~btaubman/Webpage/native.html>

SHADOZ: <http://croc.gsfc.nasa.gov/shadoz/>

IONS-06: <http://croc.gsfc.nasa.gov/intexb/ions06.html>

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Total Ozone Column Comparison

	4/27	5/8	Average
Microtops II	--	443.1	378.6
Shadowband	350.4	423.4	359.4
Ozonesonde	349	444	386.5
Satellite	353.1	349	349.9